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AN ANSWER

TO

"A PROTEST AGAINST THE USE OF THE
METRIC SYSTEM IN PRESCRIBING."

BY ✓

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FROM
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AN ANSWER TO "A PROTEST AGAINST THE USE OF THE METRIC SYSTEM IN PRESCRIBING."

SIR: In your issue of November 3d inst. appears a letter from Dr. James Orr, of Texas, under the above heading. I do not desire to provoke a controversy, but, as an advocate of the "metric system," I cannot let this statement go unanswered.

Your correspondent is peculiarly unfortunate in the three points which he submits as arguments against the new system, for in each one of them he is in error, and in each one of them is the converse of his conclusion true. He says: "1. In calculating the given quantity of a drug desired in a prescription, it can be done quicker by our or the English weights—grs., ʒ, ʒ̄, etc."

This is true certainly of a physician who knows doses only in the old system. But if he knows the doses in the metric system equally as well as in the old—which is the proper standard of comparison—the metric system is infinitely the easier and quicker method of calculating quantities. Let us take an example. The dose of *morphia* is one centigram (0.01); the dose of *chloral hydrate* is one gram (1.00). We wish to write a prescription which shall contain six doses, of a tablespoonful each. Six tablespoonfuls make one hundred grams. We have

	Grams	Decimals.	Old System.
R.—Morphiæ Sulph. . .		0.06	gr. i.
Hydrat. Chloral. . .		6	ʒivss.
Syr. Aur. Cort. . .		25	ʒiv.
Aquæ, . . . ad	100		ʒiij.

What can be simpler than this? There is but one unit, the gram and its decimal parts, written in plain Arabic numerals. It is equally easy to write the same or any other prescription for any number of doses, the only thing requisite being a knowledge of the dose in *metric* terms. Of the difficulty encountered when one does not know the dose in metric terms, but must laboriously translate it from the incongruous weights and measures of the old system, I have nothing to say.

The same *R.* in the old system is given alongside the metric *R.* Who that is unprejudiced can say that it is simpler? There are four different units—grains, scruples, drachms, and ounces—related to each other by different and arbitrary ratios.

Three of them, scruples (\mathfrak{D}), drachms (\mathfrak{Z}), and ounces ($\mathfrak{℥}$), are represented by arbitrary and unmeaning hieroglyphics, and the quantities are expressed in the awkward Roman numerals, instead of the Arabic numerals in common use. Another point which illustrates the superiority of the metric over apothecaries' weights in calculating quantities, is the use of percentages.

In making lotions, collyria, etc., we speak of so much per cent. strength; as a five per cent. solution of carbolic acid for a dressing to a wound.

What is simpler than writing

R.—Acidi carbolici, 5 grams.
 Aquæ, 100 " —M.
 Use as lotion.

Calculate a five per cent. solution in grains and ounces, and see how great is the difference in simplicity and trouble. With just as great ease can *any* percentage be written for.

2. The second point of Dr. Orr is, that there is greater

liability to error in the metric prescription than in the old form. If he compares a physician familiar with the old system, writing in the old way, with one who is also familiar with the old, but does not know the new—writing in the metric terms—he is probably right. But such a comparison is unfair. If we compare physicians equally familiar with the system in which they write, the advantage is altogether in favor of the metric.

In the latter there is but one unit; the quantities are written in plain figures and the aggregate shows the proportionate quantity of each. In the former there are as many units as are found in the tables of apothecaries' weights and measures; they are expressed by arbitrary hieroglyphics; quantities are in Roman numerals, and the aggregate does not show the proportion.

How often does it happen that a physician looking over a prescription he has written, finds he has written the drachm mark where he meant scruple, or *vice versa*.

How is the pharmacist to know which is meant? To be sure it is careless writing, but it occurs continually, as the pharmacist's *R* files will testify. Such a blunder cannot be made in the new system. As to the danger of misplacing the decimal, this is obviated by the use of the decimal line; then if a mistake is made, we have no apology to offer. It is just as reasonable to expect the merchant in his ledger, to charge his customer ten cents a yard for silk, instead of ten dollars, by putting it in the wrong column.

In fact, the decimal system applied to medicine is identical with our cental currency applied to money. It needs no argument to prove that our present money system is preferable to the old-fashioned "fips" (6¼ cents), "levies" (12½ cents), "picayunes," and "York shillings," or that it is far superior to the English system of £, shillings, pence, and farthings. Yet exactly the same differences hold in medicine between the new,

or metric system, and the old, or apothecaries' weights and measures. I think, however, no one among us, not even the "oldest inhabitant," would be willing to exchange our dollars, dimes, and cents for the British coinage, or even return to the good old times of Colonial coinage.

The third point of Dr. Orr is that "It takes less time and space to write the old method." The only answer we need make to this statement is, that the difference in point of space between the old and the new is that in the former the value of each quantity, as gr. \mathfrak{g} , \mathfrak{ss} , or \mathfrak{z} , must be written with the amount, whereas, in the latter, there is but one unit, and only the quantities are given. This would make it appear that the "old method" takes *more* space than the new.

In the specimen of prescription given, a very poorly written metric prescription is chosen. I repeat it here in order to show how such a prescription should have been written, and then leave it to the impartial reader to judge whether it is so complicated or difficult to understand. The prescription Dr. Orr gives is as follows :

"R.—Morph. Muriat.,	.	.	.	.0060.
Tinct. Cannab. Ind.,	.	.	.	.0800.
Chloroformi,	.	.	.	.1350.
Ol. Menth. Pip.,	.	.	.	.0025.
Tinct. Capsici,	.	.	.	.0025.
Acid. Hydrocyanici Dil.,	.	.	.	.0170.
Alcohol,	.	.	.	.3000.
Glycerinæ,	.	.	.	.4570.—M."

No dose is stated, but from the amounts I should suppose this to be intended for one dose. I cannot imagine who could have written such a prescription, and I do not wonder at any physician finding fault with it. It certainly violates every rule of correct prescribing, and

must, I think, have been (in the journal from which copied) a clumsy attempt to translate grains and parts of grains into metric terms.

The observance of a few simple rules are a wonderful help to correct and easy prescribing :

1. The ingredients should be placed in the order of their strength and importance. If the mixture contains both solids and liquids, place the solids first in this order, and then the liquids, in like order.

2. Write down first all the ingredients intended to be ordered.

3. Determine the number of doses to be given in the prescription, and make the quantities to correspond.

4. If a liquid is ordered, let the vehicle be named last, and by placing after it the term "*ad*," or "*ad q.s.*," let it show how much the entire prescription calls for. In this way there is no necessity of adding up the amounts to see how much they make.

Now for this objectionable R—under these rules. We write down the ingredients in proper order, and determine to make twelve doses, of a dessertspoonful each.

This R is supposed to be an anodyne, for internal administration. The doses in the above copy of some of the ingredients are decidedly homœopathic. We shall give the usual doses, as follows :

R.—Morphiæ Sulph. (dose, 0.01), . . .	0	12
Ol. Ment. Pip. (dose, 0.05), . . .	0	60
Ac. Hydrocyan. Dil. (dose, 0.10), . . .	1	20
Chloroformi (dose, 0.30), . . .	3	60
Tr. Cannab. Ind. (dose, 2.00), . . .	24	
Tr. Capsici (dose, 2.00), . . .	24	
Glycerinæ (dose, 2.00), . . .	24	
Alcohol,	ad,	100/00

M. S. Dessertspoonful every 4 hours in water, until relieved.

It is not very often, I believe, that a physician writes as complex a prescription as this one, but when he does, he needs the metric system. A comparison between this and the example given in the paper criticised, will show the difference between a properly and an improperly written metric prescription.

R	METRIC PRESCRIPTION.	Grams. Decimal.	
[Obverse.]			

[Reverse.]	METRIC SYSTEM IN MEDICINE.		
	Old Style.	Grams.	Decimal.
	1 grain or 1 minim equals.....	0	06
	15 grains or 15 minims equal.....	1	00
	1 dram or 1 fluidram equals	4	00
	1 ounce or 1 fluidounce equals.....	32	00

The Cubic Centimeter (C. C.) may be considered identical with the gram for water or aqueous solutions.

Liquids lighter or heavier than water should either be weighed or a proper allowance be made.

Being a pioneer in the metric line in my own city some four years ago, I anticipated trouble from the pharmacists in connection with my prescriptions. But few of them were familiar with the system, and at first there was some grumbling; but when they learned how simple it is, and obtained the weights and meas-

ures, there was no more trouble. Now I do not believe there is a pharmacist in the District of Columbia but prides himself on being able to compound "metric prescriptions." I enclose the form of prescription blank which I have always used. The reverse contains brief but ample directions for converting the metric terms into apothecaries' weights, for the benefit of such druggists who may not have metric weights.

This letter is in a measure an advocacy of the metric system, but space does not allow of any extended argument to prove its superiority. I will, therefore, close by stating briefly some of the reasons for its adoption generally:

1. Its simplicity—

One unit of length	= the <i>meter</i> .
One unit of capacity	= the <i>liter</i> .
One unit of weight	= the <i>gram</i> .
One unit of cubic measure	= the <i>ster</i> .
One unit of sq. measure	= the <i>are</i> .

The divisions and multiples of these units are by tens. At present there are over seventy arbitrary units in use in the United States.

2. Its substitution for our present system of weights and measures would save an immense amount of time and labor in all forms of business. *It would save one year of school life for every child.* In Appleton's *Cyclopædia*, under article weights and measures of the United States, over seventy units are given as in use, and they are utterly independent of any systematic relation to each other. Think of having to multiply by 1728 to find how many cubic inches are in 1883 cubic feet! Yet this is but one item of but one of the miserable tables that all our school children are obliged to memorize. And not that only, but these heterogeneous

tables must be applied to all the examples in arithmetic to be worked out during all the years the unfortunate juvenile is at school.

3. The metric system is the cosmopolitan system. It is legalized by twenty-three nations of the civilized world, and is in exclusive use in thirteen nations. It is legalized in the United States by special Act of Congress passed in 1866. The English foot is only in use in Great Britain, Russia, and the United States.

4. It is used by scientists in all countries.

5. It is used exclusively by the U. S. Coast Survey, the U. S. Marine Hospital Service, and the U. S. Navy. Also by a large number of physicians, especially in the north and northwestern sections of our country.

Other arguments might easily be adduced, but as this is not intended to be an exhaustive article, I rest here.

Objections to introduction of the metric system in the United States.

1. It revolutionizes existing weights and measures.

2. It is difficult, I might say well-nigh impossible for established physicians to forget the old system.

As to the first of these, each person must weigh the arguments *pro* and *con* and decide for himself. In my opinion, the "game is worth the candle."

As to the second objection, older physicians should not be expected to make the change, unless, indeed, they be teachers. But all students should be taught, and should learn the new system exclusively.

In this way a revolution may be accomplished without doing violence to any one's principles.

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